

Bellwork: 1/14/13

Solve the following quadratic equation:

$$2x^2 + 7 = 6x$$

$$2x^2 - 6x + 7 = 0$$

$a=2$ $b=-6$ $c=7$

$$\frac{6 \pm \sqrt{(-6)^2 - 4(2)(7)}}{2(2)}$$

$$\frac{6 \pm \sqrt{-20}}{4} = \frac{6 \pm i\sqrt{20}}{4} = \frac{6 \pm 2i\sqrt{5}}{4} = \frac{3 \pm i\sqrt{5}}{2}$$



Page 1

Section 4.5 - Writing Quadratic Equations GIVEN THE ROOTS

The roots of an equation is a value that makes the equation true.

** roots = zeros = x-intercepts = answers **

Remember:

$$x-3=0 \quad x=3$$

If 3 is a root of a function, then $(x-3)$ is a factor.

If -2 is a root of a function, then $(x+2)$ is a factor.

$$x+2=0 \\ x=-2$$

example 1: Write a quadratic equation with roots at -2 and 3.

Roots: -2 3
↳ Factors: $(x+2)(x-3)$

$$x^2 - 3x + 2x - 6$$

$$x^2 - x - 6$$

↳ Equation: $x^2 - x - 6 = 0$

Page 2

example 2: Write a quadratic equation with roots at -6 and -3.

Roots: -6 -3

→ Factors: $(x+6)(x+3)$

$$x^2 + 3x + 6x + 18$$

→ Equation: $x^2 + 9x + 18 = 0$

example 3: Write a quadratic equation with roots at -1 and 4.

Roots: -1 4

Factors: $(x+1)(x-4)$

$$x^2 - 4x + 1x - 4$$

Equation: $x^2 - 3x - 4 = 0$

example 4: Write a quadratic equation with roots at 5 and -5.

Roots: 5 -5

Factors: $(x-5)(x+5)$

$$x^2 + 5x - 5x - 25$$

Equation: $x^2 - 25 = 0$

example 5: Write a quadratic equation with roots at 0 and -2.

Roots: 0 -2

Factors: $(x-0)(x+2)$

$$x(x+2)$$

Equation: $x^2 + 2x = 0$

example 6: Write a quadratic equation with roots at $\frac{1}{2}$ and $-\frac{3}{4}$.

Roots: $\frac{1}{2}$ $-\frac{3}{4}$

Factors: $(x - \frac{1}{2})(x + \frac{3}{4})$

$$2x - 1 = 0$$

$$2x = 1$$

$$x = \frac{1}{2}$$

$$(2x - 1)(4x + 3)$$

$$8x^2 + 6x - 4x - 3$$

Equation: $8x^2 + 2x - 3 = 0$

example 7: Write a quadratic equation with roots at $\frac{2}{3}$ and $\frac{3}{2}$.

Roots: $\frac{2}{3}$ $\frac{3}{2}$

Factors: $(3x - 2)(2x - 3)$

$$6x^2 - 9x - 4x + 6$$

Equation: $6x^2 - 13x + 6 = 0$

Homework: pg 232 #3-7

Page 9

Practice:

- ① Roots are 5 and 3
- ② Roots are $\frac{5}{2}$ and 4
- ③ Roots are -4 and 4
- ④ Roots are $\frac{3}{2}$ and -2

Page 10

